



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,859	04/13/2004	Ujjwal Manna	3095-011	2663
22429 7590 09/04/2007 LOWE HAUPTMAN HAM & BERNER, LLP 1700 DIAGONAL ROAD SUITE 300 ALEXANDRIA, VA 22314			EXAMINER BOYER, RANDY	
			ART UNIT 1764	PAPER NUMBER
			MAIL DATE 09/04/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/822,859

Applicant(s)

MANNA ET AL.

Examiner

Randy Boyer

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12, 14-17, 19 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12, 14-17, 19 and 21-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. Examiner acknowledges Applicant's response filed 9 July 2007 containing amendments to the claims and remarks.
2. The previous rejection of claims 1-12, 14-17, and 19 under 35 U.S.C. 103(a) are maintained. Likewise, newly added claims 21-25 are rejected under 35 U.S.C. 103(a).
The rejections follow.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

Art Unit: 1764

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1-4, 9, 14, 17, 19, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable in view of Hantzer (US 2003/0062292).
7. With respect to claim 1, Hantzer discloses a process for preparing food grade solvents of naphtha range containing very low aromatics, the process comprising the steps of: (a) heating the naphtha range petroleum feed stock to 150°C (see Hantzer, page 3, paragraph 27); (b) adding a stoichiometric hydrogen to the naphtha range petroleum feed stock at a pressure of about 34 bar (see Hantzer, page 3, paragraph 27); (c) passing the mixture of step (b) through a reactor having a nickel based catalyst (see Hantzer, pages 3-4, paragraph 31); and (d) recovering a food grade hydrocarbon solvent of naphtha range containing very low aromatics (see Hantzer, Abstract; and page 2, paragraph 13).

Hantzer does not disclose wherein the stoichiometric amount of hydrogen is

added to the naphtha range petroleum feed at a pressure between about 5 to 30 bar.

However, Hantzer explains that the process of his invention is operable over a range of conditions consistent with the intended objectives of product quality (see Hantzer, page 4, paragraph 36). Furthermore, Hantzer explains that the process conditions of temperature and pressure are significantly mild compared to conventional hydroprocessing technology (see Hantzer, page 4, paragraph 36). Finally, Examiner notes that differences in process conditions will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such conditions are critical (see MPEP § 2144.05 (II)(A) (citing *In re Aller*, 220 F.2d 454 (CCPA 1955)).

Therefore, it would have been obvious to the person having ordinary skill in the art at the time the invention was made to modify the process conditions of Hantzer to provide for a supply of hydrogen at a pressure between about 5 and 30 bar.

8. With respect to claim 2, Hantzer discloses wherein the feed is a raffinate resulting from the solvent treatment of a light to heavy neutral distillate oil (see Hantzer, page 2, paragraph 19).

9. With respect to claim 3, Hantzer discloses wherein the raffinate feed has a sulfur content less than 50 ppm (see Hantzer, Example 3).

10. With respect to claims 4 and 23, Hantzer discloses wherein the raffinate stream is obtained from a distillate fraction that has been extracted, thus implying a low aromatics content (see Hantzer, page 2, paragraph 19).

Art Unit: 1764

11. With respect to claim 9, Hantzer discloses wherein the catalyst is supported on a refractory metal oxide support (see Hantzer, pages 3-4, paragraph 31).
12. With respect to claim 14, Hantzer discloses wherein the product contains nil olefins, sulfur less than 1 ppm, and aromatics less than 20 ppm (see Hantzer, Table I).
13. With respect to claim 17, Hantzer discloses wherein the process is carried out under a hydrogen environment at 150°C and about 34 bar (see Hantzer, page 3, paragraph 27).
14. With respect to claim 19, Hantzer discloses wherein the catalyst is pre-reduced before loading into the reactor (see Hantzer, pages 3-4, paragraph 31).
15. With respect to claims 21 and 22, Hantzer discloses wherein the raffinate stream has sulfur content of 2.1 ppm (see Hantzer, Example 1). Moreover, Hantzer discloses wherein the raffinate stream may be any petroleum hydrocarbon fraction capable of yielding a product of the desired purity (i.e. having substantially no sulfur) (see Hantzer, page 2, paragraphs 18 and 19).
16. Claims 10-12, 15, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hantzer (US 2003/0062292) in view of Cody (US 6974535).
17. With respect to claims 10 and 24, Hantzer discloses a process for preparing food grade solvents of naphtha range containing very low aromatics, the process comprising the steps of: (a) heating the naphtha range petroleum feed stock to 150°C (see Hantzer, page 3, paragraph 27); (b) adding a stoichiometric amount of hydrogen to the naphtha range petroleum feed stock at a pressure of about 34 bar (see Hantzer, page 3, paragraph 27); (c) passing the mixture of step (b) through a reactor having a nickel

based catalyst (see Hantzer, pages 3-4, paragraph 31); and (d) recovering a food grade hydrocarbon solvent of naphtha range containing very low aromatics (see Hantzer, Abstract; and page 2, paragraph 13); wherein the naphtha range petroleum feed is raffinate resulting from solvent treatment of a light to heavy neutral distillate oil (see Hantzer, page 2, paragraph 19).

Hantzer does not disclose wherein the stoichiometric amount of hydrogen is added to the naphtha range petroleum feed at a pressure between about 5 to 30 bar or wherein the metal catalyst loading is in the range of 10-70% by weight.

However, Hantzer explains that the process his invention is operable over a range of conditions consistent with the intended objectives of product quality (see Hantzer, page 4, paragraph 36). Furthermore, Hantzer explains that the process conditions of temperature and pressure are significantly mild compared to conventional hydroprocessing technology (see Hantzer, page 4, paragraph 36). In this regard, Examiner notes that differences in process conditions will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such conditions are critical (see MPEP § 2144.05 (II)(A) (citing *In re Aller*, 220 F.2d 454 (CCPA 1955)). In addition, Cody discloses a process for producing a lubricating oil basestock by selectively hydrotreating a raffinate from a solvent extraction zone with a catalyst containing a metal loading greater than 30% by weight (see Cody, column 5, line 27). Cody explains that the catalyst, which may be a nickel-based catalyst on a refractory metal oxide support (e.g. alumina) (see Cody, column 5, lines

19-31), is effective at reducing the concentration of polynuclear aromatic species present in the raffinate to very low levels (see Cody, column 9, lines 16-20).

Therefore, the person having ordinary skill in the art of processes for preparing polymer or food grade hydrocarbon solvents would have been motivated to modify the process conditions of Hantzer to (1) provide for a supply of hydrogen at a pressure between 5 and 30 bar, and (2) use a hydrotreating catalyst with nickel loading between about 10% and 70% by weight (as taught by Cody) in order to effect a removal of aromatic species to a very low level.

Finally, the person having ordinary skill in the art of processes for preparing polymer or food grade hydrocarbon solvents would have had a reasonable expectation of success in modifying the process of Hantzer as described above because (1) Hantzer is not specifically limited to the process conditions disclosed or used in the Examples of his specification (see Hantzer, page 4, paragraph 36); and (2) both Hantzer and Cody are directed to processes for producing higher quality mineral oils having a reduced aromatics content.

18. With respect to claim 11, Cody discloses wherein the metal surface area is about $30 \text{ m}^2/\text{g}$ (see Cody, column 5, lines 27 and 65).

19. With respect to claim 12, Cody discloses wherein the physical surface area of the nickel-alumina catalyst is $100 \text{ m}^2/\text{g}$ and the pore volume of the catalyst is $0.25 \text{ cm}^3/\text{g}$ (see Cody, column 5, lines 64-66).

Art Unit: 1764

20. With respect to claims 15 and 25, Cody discloses wherein the feed is obtained from the solvent extraction zone of a vacuum or atmospheric distillation unit and of poor quality (see Cody, column 4, lines 25-39).

21. Claims 4-8, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hantzer (US 2003/0062292) in view of Everett (US 5294327).

22. With respect to claim 4, Hantzer discloses a process for preparing food grade solvents of naphtha range containing very low aromatics, the process comprising the steps of: (a) heating the naphtha range petroleum feed to 150°C (see Hantzer, page 3, paragraph 27); (b) adding a stoichiometric hydrogen to the naphtha range petroleum feed stock at a pressure of about 34 bar (see Hantzer, page 3, paragraph 27); (c) passing the mixture of step (b) through a reactor having a nickel based catalyst (see Hantzer, pages 3-4, paragraph 31); and (d) recovering a food grade hydrocarbon solvent of naphtha range containing very low aromatics (see Hantzer, Abstract; and page 2, paragraph 13).

Hantzer does not disclose wherein the stoichiometric amount of hydrogen is added to the naphtha range petroleum feed at a pressure between about 5 to 30 bar or wherein the feed has an aromatics content less than 20% by weight.

However, Hantzer explains that the process his invention is operable over a range of conditions consistent with the intended objectives of product quality (see Hantzer, page 4, paragraph 36). Furthermore, Hantzer explains that the process conditions of temperature and pressure are significantly mild compared to conventional hydroprocessing technology (see Hantzer, page 4, paragraph 36). In this regard,

Art Unit: 1764

Examiner notes that differences in process conditions will generally not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such conditions are critical (see MPEP § 2144.05 (II)(A) (citing *In re Aller*, 220 F.2d 454 (CCPA 1955)). In addition, Everett discloses a process for the production of food grade quality solvents via the hydrogenation of a naphthenic distillate wherein the feed distillate contains about 15-25 % by weight of aromatic hydrocarbons (see Everett, column 2, lines 39-57).

Therefore, it would have been obvious to the person having ordinary skill in the art of processes for preparing polymer or food grade hydrocarbon solvents would have been motivated to modify the process conditions of Hantzer to (1) provide for a supply of hydrogen at a pressure between 5 and 30 bar, and (2) provide for use of a feed having an aromatics content of less than 20% by weight (as taught by Everett) in order to achieve a food grade quality mineral oil.

Finally, the person having ordinary skill in the art of processes for preparing polymer or food grade solvents would have had a reasonable expectation of success in modifying the process of Hantzer as described above because (1) Hantzer is not specifically limited to the process conditions disclosed or used in the Examples of his specification (see Hantzer, page 4, paragraph 36); and (2) both Hantzer and Everett are directed to processes for producing food grade quality mineral oils having a reduced aromatics content.

Art Unit: 1764

23. With respect to claims 5, 8, and 16, Everett discloses use of a naphthenic distillate feed having an aromatics content in the range of 15-25% by weight (see Everett, column 2, lines 56-57).

24. With respect to claims 6 and 7, Everett discloses use of a naphthenic distillate feed. Naphthas are known in the art to have boiling points in the range between about 40°C and 170°C.

Response to Arguments

25. Applicant's arguments filed 9 July 2007 have been fully considered, but they are not persuasive.

26. Examiner understands Applicant's principal arguments to be:

- I. The pressure range disclosed in paragraph 27 of Hantzer is entirely non-overlapping as compared to the pressure range used in Applicant's process.
- II. The catalyst used in the second stage of Hantzer is not a nickel based catalyst.
- III. Hantzer does not disclose addition of a stoichiometric quantity of hydrogen to the second stage.
- IV. Contrary to Hantzer, Applicant's process involves only one reaction stage and a single temperature and pressure value range.
- V. Paragraph 36 of Hantzer cannot be construed to mean that the process described therein is operable outside the range of operating conditions explicitly disclosed.
- VI. According to Hantzer, only the catalyst used in stage 4 is a nickel-based catalyst.

Art Unit: 1764

27. With respect to Applicant's first argument, Hantzer discloses a lower range operating pressure of 3549 kPa (i.e. 35.49 bar) (see Hantzer, page 3, paragraph 27). Examiner notes that this pressure represents a difference of only about 18% from the upper limit claimed by Applicant in step (b) of claim 1. Moreover, because Applicant uses the word "about" to define the operating range of pressure, Examiner finds that Applicant's claimed pressure range will extend to some point *beyond* 30 bar such that the upper limit of Applicant's pressure range will touch or overlap the lower limit operating pressure of Hantzer's process.

Furthermore, Examiner notes paragraph 36 of Hantzer wherein he explains "[t]he process of this invention is operable over a range of conditions consistent with the intended objectives . . . the conditions of temperature and pressure are significantly mild relative to conventional hydroprocessing technology . . .". Thus, Hantzer is not specifically limited to the process ranges that he explicitly discloses in the specification of his patent. Moreover, Hantzer actually favors mild processing conditions, i.e. processing at lower temperatures and pressures.

28. With respect to Applicant's second argument, Hantzer explains that catalysts suitable for use in his stage 2 are those comprised of at least one noble or non-noble metal of Group VIII of the Periodic Table (see Hantzer, page 3, paragraph 21). In this regard, Examiner notes the nickel is a non-noble metal of Group VIII of the Periodic Table.

29. With respect to Applicant's third argument, Hantzer discloses in paragraph 27 the addition of hydrogen treat gas rates from 500 to 10,000 scf/B (see Hantzer, page 3,

paragraph 27). In this regard, Examiner understands “stoichiometric amount of hydrogen” to mean the minimum amount of hydrogen required to carry out the hydrogenation reaction. Thus, Examiner finds it to be of no consequence that Hantzer may use an amount of hydrogen in excess of a stoichiometric amount since the amount Hantzer uses will be *at least* a stoichiometric amount of hydrogen, i.e. Applicant does not claim “adding *no more than* a stoichiometric amount of hydrogen.”

30. With respect to Applicant’s fourth argument, Examiner notes that while Hantzer describes his process as having what appears to be four distinct stages, Hantzer also explains that the entire process can be carried out in a single process unit, and wherein the entire process could be carried out at the same temperature and pressure or with different sections being controlled separately such that different sections may have different process conditions (see Hantzer, page 4, paragraph 32).

31. With respect to Applicant’s fifth argument, Examiner submits that Hantzer may be relied upon for all that he explicitly discloses and implicitly suggests to one of ordinary skill in the art. In this regard, Examiner notes paragraph 36 of Hantzer wherein he explains “[t]he process of this invention *is operable over a range of conditions consistent with the intended objectives . . . the conditions of temperature and pressure are significantly mild relative to conventional hydroprocessing technology . . .*” (emphasis added). Thus, Hantzer is not specifically limited to the process ranges that he explicitly discloses in the specification of his patent. Moreover, Hantzer actually favors mild processing conditions, i.e. processing at lower temperatures and pressures.

32. With respect to Applicant's sixth argument, Hantzer discloses the use of nickel-based catalysts and/or sorbent materials in all stages of his process (see Hantzer, page 3, paragraph 20 (disclosing use of a Ni/Mo catalyst in the first stage); page 3, paragraph 21 (disclosing the use of a Group VIII non-noble metal catalyst in the second stage); page 3, paragraph 28 (disclosing the use of nickel as a catalyst/sorbent material in the third stage); and pages 3-4, paragraph 32 (disclosing nickel as a preferred catalyst material in the fourth stage)).

Conclusion

33. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

34. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-

Art Unit: 1764

7113. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB



Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700